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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 45

Application Number: 08/327,744
Filing Date: October 24, 1994
Appellant(s): STONE ET AL.

MAILED
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GROUP 3700

J. Kevin Grogan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 13, 2004.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is incorrect.

The Appellant's statement is disagreed with to the extent that the amendment referred by the Appellant was an amendment that lead to the Final Rejection as opposed to an amendment after Final.

Thus, no amendment after final has been filed.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(7) *Grouping of Claims*

The rejection of claims 1-8 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

It is respectfully noted to the Board that the Appellant states claims 1-8 do (as opposed to do not) stand or fall together.¹

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of Record*

5,167,721	McCOMAS et al	12-1992
4,731,125	CARR	05-1988
4,433,845	SHIEMBOB	02-1984
4,409,054	RYAN	10-1983
4,218,066	ACKERMANN	08-1980

The Admitted Prior Art (hereinafter referred to as 'Prior Art'), application specification, p. 1, ll. 8-28.

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

¹ Brief 2 (in reference to the current Brief, henceforth it will be referred to as 'Brief 2'), p. 3, ll. 23-25.

Claims 1-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted Prior Art (hereinafter referred to as 'Prior Art' - specification p. 1, ll. 8-28) in view of McComas et al and Carr.

The Prior Art discloses the invention substantially as claimed including the metal honeycomb structure of abradable seals and the art recognized fact that these seals are periodically removed by various means. However, the Prior Art lacks a specific teaching for removing the seal via a pressurized liquid at a specific angle and striking location. In that regard, McComas et al clearly teaches that it is common practice in the art to perform routine engine maintenance which frequently requires removal of coatings in the abradable seals. See c. 1, ll. 60-67. Specifically, McComas et al clearly teaches a method of removing coating (1), i.e. abradable seals, by utilizing a high pressure liquid stream (5) directed at the abradable seal at an angle and removing the same by relative movement between the seal and the stream, this step including pressure and angle of the liquid stream as claimed, wherein this method allows for removal of the seal without damaging the substrate. See Figs. 1-1A, Abstract, c. 1, l. 19 - c. 3, l. 66. Thus, McComas et al at the very least teaches that removal of abradable seals via pressurized liquid stream is one of various methods known in the art. Moreover, Carr teaches a method of removing a coating (30, 32) wherein the optimal angle for the pressurized liquid stream (24) in facilitating removal of the layer during movement with respect to the work is less than 90° since that angle allows for more removing media to be available to dislodge the layer from the substrate - the layer being removed includes a "braze" since the adherent of the adhered layer clearly encompasses "braze." Fig. 2, c. 4, ll. 55-66. Thus, it would have been obvious to the ordinary artisan at the time of the instant to provide the Prior

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Art with the step of removing the honeycomb structure by directing a high pressure liquid stream striking the substrate at the base of the honeycomb at an angle less than 90° as taught by McComas et al and Carr in order to facilitate removal of the honeycomb and braze without damaging the substrate.

Regarding claim 8, the modified method of the Prior Art includes the ribbon direction since the straight line movement of the liquid would be in parallel direction to the impinged ribbon of the honeycomb.

Claims 1-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shiembob, Ryan, or Ackerman in view of McComas et al and Carr.

Shiembob, Ryan, or Ackerman all disclose various forms of abradable seals for gas turbine engine comprising a metal honeycomb, braze, and substrate structure. More specifically, Shiembob teaches an insulated honeycomb seal for gas turbine engines comprising a honeycomb (2) that is inherently brazed onto a substrate (18). See whole patent. Ryan teaches another abradable seal for gas turbine engines comprising a honeycomb (2) brazed onto a substrate (1). See whole patent. Ackerman teaches a further example of an abradable seal comprising a honeycomb (28) which is inherently brazed onto a substrate (not designated by reference but see Fig. 1). See whole patent. However, none of these references specifically teach a method of removal of the honeycomb and braze from the substrate. In that regard, McComas et al clearly teaches that it is common practice in the art to perform routine engine maintenance which frequently requires removal of coatings in the abradable seals. See c. 1, ll. 60-67. Specifically, McComas et al clearly teaches a method of removing coating (1), i.e. abradable seals, by utilizing a high pressure liquid stream (5) directed at the abradable

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seal at an angle and removing the same by relative movement between the seal and the stream, this step including pressure and angle of the liquid stream as claimed, wherein this method allows removal of the seal without damaging the substrate. See Figs. 1-1A, Abstract, c. 1, l. 19 - c. 3, l. 66. Thus, McComas et al at the very least teaches that removal of abradable seals via pressurized liquid stream is one of various methods known in the art. Moreover, Carr teaches a method of removing a coating (30, 32) wherein the optimal angle for the pressurized liquid stream (24) in facilitating removal of the layer during movement with respect to the work is less than 90° since that angle allows for more removing media to be available to dislodge the layer from the substrate - the layer being removed includes a "braz" since the adherent of the adhered layer clearly encompasses "braz." Fig. 2, c. 4, ll. 55-66. Thus, it would have been obvious to the ordinary artisan at the time of the instant to provide Shiembob, Ryan, or Ackerman with the step of removing the honeycomb structure by directing a high pressure liquid stream striking the substrate at the base of the honeycomb at an angle less than 90° as taught by McComas et al and Carr in order to facilitate removal of the honeycomb and braz without damaging the substrate.

Regarding claim 8, the modified method of the Shiembob, Ryan, or Ackerman includes the ribbon direction since the straight line movement of the liquid would be in parallel direction to the impinged ribbon of the honeycomb.

(11) *Response to Argument*

Initially, it is respectfully noted to the Board that the prior decision from the Board has much bearing in resolving the issues of the instant application.² Attention is respectfully directed thereto.

In addition, with respect to the honeycomb structure and the removal thereof, the Board's decision is respectfully directed to the Examiner's complete explanation as to what McComas et al, Shiembob, Ackerman, and Ryan's teachings encompass in the last Examiner's Answer, Paper No. 33, pp. 12-17.

In response to Appellant's basic argument that the claimed invention is not rendered obvious because of the previous decision by the Board,³ this argument is traversed.

First, it is noted that the Appellant failed to address the rejection in which the Admitted Prior Art (hereinafter referred to as 'Prior Art') was used as a primary reference. The Appellant mentions the rejection based upon the Prior Art.⁴ However, the Appellant did not discuss the applicability of the same to the outstanding rejection. Thus, such an omission is construed as a concession of the Appellant to the extent that the Prior Art discloses the invention substantially as claimed including the metal honeycomb structure of abradable seals and the art recognized fact that these seals are periodically removed by various means with the exception being that the Prior Art lacks a specific teaching for removing the seal via a pressurized liquid at a specific angle and striking location. Moreover, due to the lack of specific argument against the

² Decision, Paper No. 39.

³ Brief 2, p. 7, l. 16 - p. 13, l. 4.

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combination of the Prior Art and the other applied references, the Examiner will construe this, on the one hand, as an admission that the claimed invention as being obvious. On the other hand, Appellant's arguments against Carr is construed as rebuttal against the combination of Prior Art in view of McComas et al and Carr.

Second, contrary to Appellant's assertions,⁵ the Board did not reverse the Examiner wholesale on all the applied references. The Board specifically stated the following in the decision:

“From our perspective, the combined teachings of the applied prior art, understood in light of the acknowledged background in the art (appellant's specification, page 1), would have been suggestive to one having ordinary skill in the art of removing honeycomb and braze from a substrate by directing a liquid stream at the top of the honeycomb until the braze is exposed. The motivation for practicing the latter method would have been the teaching of McComas, in particular, in explicitly revealing liquid jet erosion as a viable alternative that does not result in substrate damage, the consequence of other known removal techniques.”⁶

The only fault or deficiency that the Board attributed to the Examiner's rejection of the claims was for the recitation “striking the substrate at the base of the honeycomb.”⁷ In sum, the Board found the invention to be obvious to the extent that the combined teachings of the prior art renders obvious the method of applying jet erosion process for removal of honeycomb. The Board DID NOT reject the applicability of any of the

⁴ Brief 2, p. 7, l. 16 - p. 13, l. 4.

⁵ See e.g., Brief 2, p. 8, ll. 14-17 and 20-21; p. 9, ll. 3-4.

⁶ Decision, p. 4, ll. 8-17.

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references that the Examiner applied. Therefore, the only issue to be resolved is whether or not it would have been obvious to direct the liquid jet as claimed.

Third, the Appellant basically argues that McComas et al's teachings do not encompass honeycomb, i.e. honeycomb is not another form of an abradable seal as argued by the Examiner.⁸ This argument must fail because nothing in the decision by the Board contradicts the Examiner's view that the teachings of McComas et al in fact encompass honeycomb structures used in the aircraft turbine industry.

In response to Appellant's basic argument that Carr is nonanalogous art,⁹ it has been held that a prior art reference must either be in the field of Appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the Appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Carr is fully analogous prior art as set forth *infra*.

First, Carr is within the field of Applicant's endeavor in that both concern removal of the unwanted layer from the substrate vis-à-vis pressurized liquid or media, i.e. cleaning and/or removing the unwanted layer so as to facilitate reuse of the substrate. In Carr, pressurized media is used to remove adherent material, such as paint or *other coverings*, from surfaces, whereas Appellant's invention is directed to removing the metal honeycomb and braze from the substrate. It is noted that the honeycomb and braze are "adherent material" because these parts combined are adhered to the substrate, and Carr's "other coverings" would encompass honeycomb and braze to the

⁷ Decision., p. 4, l. 17 - p. 5, l. 1.

⁸ Brief 2, e.g., p. 6, ll. 5-15.

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extent that the honeycomb and braze form a covering on the substrate as noted by the teachings of McComas et al as well as Appellant's disclosure. Note also in Carr, e.g., c. 2, ll. 1-4, which further supports the Examiner's conclusion that Carr is analogous art.

That portion states:

“Blast cleaning with plastic media has been shown to be effective on the metal parts of *aircraft*, but was not previously considered suitable for stripping composites.” (Emphasis added.)

That portion of Carr's teachings are related to the prior art of Carr. Appellant's honeycomb and braze are involved in the aircraft industry. Thus, Carr's teachings are analogous since Carr recognizes the use of Carr's method in aircraft parts.

Second, even if Carr *may* not be within the field of Appellant's endeavor, Carr is still analogous to the extent that Carr is reasonably pertinent to the particular problem with which the Appellant was concerned, namely a method of removing the unwanted layer without damaging the substrate. Appellant has argued numerous times that conventional removal methods, i.e. non liquid jet erosion process, resulted in damaging the substrate and thereby undermining the reusability of the substrate. In the same vein, Carr's teachings also recognized that convention removal methods results in damaged substrates. Thus, Carr uses pressurized media containing relatively “soft” particles to remove the undesirable layer. The Appellant asserts that one of ordinary skill in the art would not look towards Carr's paint removal method for guidance in

⁹ Brief 2, p. 8, . 3 - p. 12, l. 7.

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removing the honeycomb in an aircraft engine turbine, but it is not clear to the Examiner how this assertion can be reconciled against the fact that Carr's teachings encompass aircraft parts and that in combination with the teachings of McComas et al, since both teach or suggest the obviousness of applying pressurized media in removing unwanted material from aircraft parts.

Third, Appellant's assertion regarding the pressure and the use of media in Carr versus that of the claims is irrelevant.¹⁰ Carr's teachings have been applied with respect to the directing angle as opposed to any pressure or media in claim 1. Notably, claim 1 does not include any limitations regarding the specific pressure nor does the claim include any limitations as to whether or not other media may be included in the stream. Thus, it is emphasized that Appellant's assertions along these points are irrelevant. Appellant is reminded that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). This is in reference to claim 1. Moreover, McComas et al already teaches the pressure of the liquid stream. Therefore, there is no need to consider such teachings with respect to Carr. The fact that Carr uses pressurized media is a *prima facie* case of obviousness for the claimed directing angle as taught and suggested by Carr in combination with the teachings of McComas et al. Furthermore, while acknowledging that Carr's method uses 'media', e.g. air plus particles, it is known to the ordinary artisan in the art of cleaning or removal that such media are one of several different methods and means for removing the

¹⁰ Brief 2, e.g., p. 8, ll. 8-13 and p. 9, l. 10 - p. 10, l. 2.

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unwanted layer as noted by McComas et al. See e.g., McComas et al, c. 1, l. 60 - c. 2, l. 20.

Fourth, Appellant's assertion that Carr somehow teaches away from the present invention¹¹ is traversed. It is not clear to the Examiner how Carr's teachings of angular directing of the media, i.e. "to avoid putting excessive force into the surface of the composite" (Carr, c. 4, ll. 47-55), would prevent the ordinary artisan from applying this suggestion in combination with the teachings of McComas et al. Carr teaches that the angle in which the media is directed increases the efficiency of removal than that would be achieved if the angle was perpendicular. It may even be argued that even without the express teachings of Carr, the angular orientation of the media/fluid stream, i.e. non-perpendicular, directed at the base is a widespread known method. As an analogy, a typical person cleaning the driveway of debris, e.g., dirt, leaves, grass, etc., via a water hose would direct the pressurized fluid at a non-perpendicular angle, since that facilitates faster removal of the debris, i.e. more efficient. The angled fluid provides two advantages over perpendicular - (1) the debris is lifted off the surface of the driveway faster and (2) the debris is forced in the direction of the reflected spray in generally one direction rather than in a circular path. How would these underlying principles - the Examiner would even suggest that these principles are inherent in applying fluid at an angle - teach away from the present invention? With regards to the difference in pressures in McComas et al and Carr, this difference is directly dependent upon the strength of the adhered layer to be removed. In other words, Carr uses a lower pressure because the adhered layer does not require excessive force to remove the same.

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Conversely, McComas et al uses a higher pressure because that is what would be required to remove the adhered layer, i.e. coating, which inherently has a higher adherence to the substrate than that of paint. As Appellant states, the “adjustment of the angle of the glass bead stream in Carr is to ensure that minimal energy is put into the substrate itself,” this further supports the Examiner’s position that the combined teachings of McComas et al and Carr would not teach away from the present invention. As noted *supra*, both references teach and focus upon the problem of preventing damage to the substrate. Therefore, if the stream as taught by McComas et al is directed at an angle at the base of the adherent as taught by Carr, that would further optimize removal of the coating, i.e. honeycomb layer, because that would ensure minimal energy is put into the substrate itself and thereby prevent damage thereof. Furthermore, it is not clear how the combined teachings would be ineffective, destructive, or both. The combined teachings do not necessarily require consideration of glass beads as Appellant argues because again, Carr’s teachings have been applied to teach the obviousness of the angle at the base and not the material of the fluid or media nor the pressures in which they are applied. It is irrelevant whether the fluid pressures used by the Appellant’s invention is applied to the composite structure of Carr because Carr is not the primary reference nor is Carr being modified by the teachings of the other applied references.

Fifth, in response to Appellant’s basic assertion that Carr does not teach any criticality between the various interface or surfaces,¹² this argument is traversed. This argument is couched in the misdirected assertion that Carr’s method is “unfocused.”

¹¹ Brief 2, p. 10, l. 3 - p. 11, l. 2.

¹² Brief 2, p. 11, l. 3 - p. 12, l. 7.

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This assertion flies in the face of specific teachings of Carr in which the interface between the composite layer and the substrate surface is of importance as noted in c. 4, ll. 55-67 of Carr. Furthermore, it is irrelevant whether Carr includes a *specific* or *explicit* reference to directing the stream to the “substrate at the base of the honeycomb”, since both the Prior Art and Shiembob, Ryan, or Ackerman all teach that periodic removal of metal honeycomb is known, since McComas et al teaches the obviousness of using liquid jet erosion to remove that honeycomb and braze layer, i.e. “coating” as defined by McComas et al, and since Carr teaches the obviousness of removing the unwanted layer by directing the stream at the interface between the unwanted layer and the substrate. The teachings of the references combined teach the obviousness of directing the stream as claimed since that results in having more media involved in removing the unwanted layer, i.e. it is more efficient.


In sum, Carr is analogous art and the combined teachings of McComas et al and Carr teach or suggest directing the pressurized stream at the base of the honeycomb structure to thereby remove the same and prevent damage to the substrate.


For the above reasons, it is believed that the rejections should be sustained.


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Respectfully submitted,

cg 
April 5, 2004


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